



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,047	08/21/2003	Sampath Purushothaman	YOR920030029US2 (16841)	6546
23389 7590 05/01/2008 SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530				
EXAMINER				
GRAYBILL, DAVID E				
ART UNIT		PAPER NUMBER		
2822				
MAIL DATE		DELIVERY MODE		
05/01/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/645,047

**Applicant(s)**

PURUSHOTHAMAN ET AL.

**Examiner**

David E. Graybill

**Art Unit**

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 9-11 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-11 and 13-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2822

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 8-11 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art and Van Andel (5287003).

In the instant specification, paragraphs 3-18, 39, 45, 48, 51-54, 56 and 60, applicant admits as prior art the following:

Re claim 1: A structure for interconnecting semiconductor components comprising: a layered substrate 100 for transferring; said layered substrate

Art Unit: 2822

including a semiconductor substrate 101, a device layer 102 located directly on an upper surface of said semiconductor substrate, and an interconnect layer 103 abutting an upper surface of said device layer, said interconnect layer including a blanket layer of a metallic element or a patterned metallic "Cu patterned" element having portions comprised of an insulating material to provide a patterned wiring level; a bi-layer capping coating 200 on top of the layered substrate, each layer of said coating provides adhesion and protection; said bi-layer capping coating comprising a first layer of an amino silane abutting an upper surface of said interconnect layer, said first layer of amino silane inherently is at least one of a diffusion barrier layer, a passivation layer, or a protection layer, and a second layer of an amino silane atop said first layer of amino silane, said layer of amino silane caps said blanket layer of the metallic element or the patterned metallic element; and a carrier assembly 300, 400, 500 located atop said bi-layer capping coating

Re claim 2: wherein said substrate to be transferred contains at least one semiconductor component

Re claim 3: wherein said at least one semiconducting component is selected from the group consisting of semiconductor devices, semiconductor circuits, thin-film layers, passive and/or active elements, interconnecting

Art Unit: 2822

elements, memory elements, micro-electro-mechanical elements, optical elements, optoelectronic elements, and photonic elements

Re claim 4: wherein said carrier assembly comprises a carrier wafer 500, an adhesive layer 400 and an intermediate layer 300

Re claim 5: wherein said carrier assembly comprises glass and an intermediate layer of polyimide

Re claim 6: wherein said carrier wafer is selected from the group consisting of silicon, silicon-on-insulator, silicon germanium-on-insulator, alumina, quartz, Group III-V or II-VI semiconductor wafers, and ceramics; wherein said metallic interconnect layer is a patterned wiring level

Re claim 9: wherein said blanket layer of the metallic element or the patterned metallic element is comprised of a material selected from the group consisting Ti, Ta, Zr, Hf, their silicides nitrides and their conducting siliconitrides; Cu, Al, composites of these materials with glass; and combinations thereof

Re claim 10: wherein said bi-layer capping coating provides passivation to the blanket layer of the metallic element or the patterned metallic element

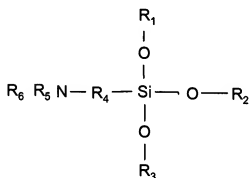
Re claim 11: wherein said capping coating comprises: a first layer that inherently serves as said diffusion barrier layer, while providing adhesion to

Art Unit: 2822

the substrate; and a second layer that is capable of providing adhesion to the carrier assembly and is an additional diffusion limiting layer

Re claim 13: wherein said second layer is an adhesion promoter to an intermediate layer 300

Re claim 14: wherein said amino silane is a compound of the formula:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>5</sub> and m are, independently of each other, hydrogen, a lower alkyl radical containing from 1 to about 6 carbon atoms, an acyl radical containing 1 to 6 carbon atoms, or an allyl, alkylene or alkynyl radical containing 2 to 6 carbon atoms, and m is a lower alkyl containing from 1 to 6 carbon atoms or an aromatic system

Re claim 15: wherein said polyimide material is selected from the group consisting of polyamic acid (PAA)-based polyimides, polyimide ester-based polyimides, and pre-imidized polyimides

Re claim 16: wherein said carrier substrate comprises glass and intermediate layer of polyimide to allow for a further release process

Art Unit: 2822

Re claim 17: wherein said first layer inherently further serves as protection (at least via adhesion and as a physical barrier) against a removal process of said carrier assembly.

To further clarify, 37 CFR 1.84(p)(4) states:

The same part of an invention appearing in more than one view of the drawing must always be designated by the same reference character, and the same reference character must never be used to designate different parts.

In addition, as illustrated in FIGS. 1 and 2, applicant discloses that both the admitted prior art and the instant invention include elements 100, 101, 102, 103, 300, 400 and 500. Therefore, all of the instant disclosure directed to elements 100, 101, 102, 103, 300, 400 and 500 describes both the admitted prior art and the instant invention.

Also to further clarify, applicant admits as prior art a bi-layer capping coating 200 on top of the layered substrate, said bi-layer capping coating comprising a first layer of an amino silane abutting an upper surface of said interconnect layer, and a second layer of an amino silane atop said first layer of amino silane because applicant admits as prior art an amino silane capping coating having "a few monolayers." Furthermore, at paragraphs 9, 16 and 17, applicant discloses as prior art "a capping layer," and it is well settled that the term "a" or "an" ordinarily means "one or more." *Tate Access Floors, Inc., and Tate Access Floors Leasing, Inc., v. Interface Architectural Resources, Inc.*, 279 F.3d 1357; 2002 U.S. App. LEXIS 1924; 61 U.S.P.Q.2D (BNA) 1647 ((citing *Tate Access Floors, Inc. v. Maxcess*

Art Unit: 2822

Techs., Inc, 222 F.3d 958, 966 n.4, 55 U.S.P.Q.2D (BNA) 1513, 1518 [\*\*32] (citing Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 977, 52 U.S.P.Q.2D (BNA) 1109, 1112 (Fed. Cir. 1999))). "This court has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.' Unless the claim is specific as to the number of elements, the article 'a' receives a singular interpretation only in rare circumstances when the patentee evinces a clear intent to so limit the article." (Citations omitted). Scanner Technologies v./COS Vision Systems, 365 F.3d 1299, 1304 (Fed. Cir. 2004).

However, applicant does not appear to explicitly admit as prior art said bi-layer capping coating comprising a first layer of silicon nitride and said first layer protects from an oxygen-based plasma removal process.

Nonetheless, at column 3, line 51 to column 6, line 3, Van Andel discloses wherein a bi-layer capping coating layer 20 comprises "silicon nitride" and a second layer of an amino silane "aminosilane" atop a first layer of silicon nitride, and said first layer protects from an oxygen-based plasma removal process. Moreover, it would have been obvious to combine this disclosure of Van Andel with applicant's admitted prior art by substituting the bi-layer capping coating 20 of Van Andel for the capping coating 200 of applicant's admitted prior art, because, as disclosed by Van



Art Unit: 2822

Andel as cited, it would desirably passivate the semiconductor component of the admitted prior art.

Moreover, it would have been obvious to substitute or combine the disclosure of Van Andel for or with the disclosure of applicant's admitted prior art because the substitution of or combination with one known element for or with another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

Furthermore, applicant's admitted prior art capping coating 200 and the bi-layer capping coating 20 of Van Andel are alternatives and equivalents; therefore, as reasoned from well established legal precedent, it would have been obvious to substitute or combine the coating 20 of Van Andel for or with the capping coating 200 of applicant's admitted prior art. See *In re May* (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); *In re Cornish* (CCPA) 125 USPQ 413; *In re Soucy* (CCPA) 153 USPQ 816; *Sabel et al. v. The Wickes Corporation et al.* (DC SC) 175 USPQ 3; *Ex parte Seiko Koko Kabushiki Kaisha Co.* (BdPatApp&Int) 225 USPQ 1260; and *Ex parte*

Art Unit: 2822

Rachlin (BdPatApp&Int) 151 USPQ 56. See also Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). "For example, where a claimed apparatus requiring Phillips head screws differs from a prior art apparatus describing the use of flathead screws, it might be hard to find motivation to substitute flathead screws with Phillips head screws to arrive at the claimed invention. However, the prior art would make it more than clear that Phillips head screws and flathead screws are viable alternatives serving the same purpose. Hence, the prior art would 'suggest' substitution of flathead screws for Phillips head screws albeit the

Art Unit: 2822

prior art might not 'motivate' use of Phillips head screws in place of flathead screws. Ex parte Jones, 62 USPQ2d 1206 (BdPatApp&Int 2001). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

Claims 1-6, 8-11 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art and Ponjée (0251347).

Applicant's admitted prior art is applied as applied supra.

However, applicant does not appear to explicitly admit as prior art wherein said bi-layer capping coating comprising a first layer of silicon nitride, and said first layer protects from an oxygen-based plasma removal process.

Nonetheless, at column 1, lines 1-29; and column 3, line 36 to column 5, line 50, Ponjée discloses wherein a bi-layer capping coating layer comprises silicon nitride 3 and a second layer of an amino silane 6 atop said first layer of silicon nitride, and said first layer inherently protects from an oxygen-based plasma removal process.

Moreover, it would have been obvious to combine this disclosure of Ponjée with applicant's admitted prior art by substituting the bi-layer capping coating 3, 6 of Ponjée for the capping coating 200 of applicant's

Art Unit: 2822

admitted prior art, because, as disclosed by Ponjée as cited, it would desirably passivate the semiconductor component of the admitted prior art.

Moreover, it would have been obvious to substitute or combine the disclosure of Ponjée for or with the disclosure of applicant's admitted prior art because the substitution of or combination with one known element for or with another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

Furthermore, applicant's capping coating 200 and the bi-layer capping coating 20 of Ponjée are alternatives and equivalents; therefore, as reasoned from well established legal precedent, it would have been obvious to substitute or combine the coating 20 of Ponjée for or with the capping coating 200 of applicant's admitted prior art. See *In re May* (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); *In re Cornish* (CCPA) 125 USPQ 413; *In re Soucy* (CCPA) 153 USPQ 816; *Sabel et al. v. The Wickes Corporation et al.* (DC SC) 175 USPQ 3; *Ex parte Seiko Koko Kabushiki Kaisha Co.* (BdPatApp&Int) 225 USPQ 1260; and *Ex parte Rachlin* (BdPatApp&Int) 151 USPQ 56. See also

Art Unit: 2822

Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). "For example, where a claimed apparatus requiring Phillips head screws differs from a prior art apparatus describing the use of flathead screws, it might be hard to find motivation to substitute flathead screws with Phillips head screws to arrive at the claimed invention. However, the prior art would make it more than clear that Phillips head screws and flathead screws are viable alternatives serving the same purpose. Hence, the prior art would 'suggest' substitution of flathead screws for Phillips head screws albeit the prior art might not 'motivate' use of

Art Unit: 2822

Phillips head screws in place of flathead screws. Ex parte Jones, 62 USPQ2d 1206 (BdPatApp&Int 2001). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

Applicant's amendment and remarks filed 7-16-7 and 1-23-8 have been fully considered, treated *supra* and further addressed *infra*.

Applicant's opine:

. . . it was admitted by the applicants that the prior art structure 'consists of: a layered structure-to-be-transferred 100, which includes bulk silicon 101 and a device layer 102 terminated by the Cu patterned wiring level 103; capping layer 200; sacrificial polyimide layer 300; adhesion layer 400; and glass carrier 500. In such a structure, only an amino silane ... is used as the capping layer 200." "Applicants opine that in describing the APPA structure, the applicants used the language 'consists of' to indicate that the prior art structure including only the elements recited. Hence, the Examiner allegation that the applicants admitted that the prior art structure includes first and second silane layers is not correct."

This opinion is respectfully deemed unpersuasive because, in the quoted passage, the language "which includes" is open ended and does not exclude additional, unrecited elements. In any case, as elucidated in the Office action, "applicant admits as prior art a bi-layer capping coating 200 comprising a first layer of an amino silane entirely on said terminal layer including said at least one metallic component and a second layer of an amino silane atop said first layer of amino silane because applicant admits as prior art an amino silane capping coating having 'a few monolayers.'

Art Unit: 2822

Furthermore, at paragraphs 9, 16 and 17, applicant discloses as prior art 'a capping layer,' and it is well settled that the term 'a' or 'an' ordinarily means 'one or more.'"

Also, applicant states:

Applicants observe that one skilled in the art normally does not draw [sic] separate layers when the composition of the deposited layer does not change as is the case of the monolayer silane coverage. . . . Applicants observe that in APPA the capping layer is a single layer comprised of an amino silane and no other material layer is reported to be present in the capping layer of the APPA.

These statements are respectfully deemed unpersuasive for the reasons elucidated supra. Moreover, it is not necessarily maintained in the Office action that another material layer (other than amino silane material) is reported to be present in the capping layer of the APPA and the prior art is not necessarily applied for this disclosure.

Applicant also asserts:

The applied secondary references of Van Andel et al. and Ponjée et al. do not alleviate the above defects in AAPA since the applied secondary reference are [sic] concerned with chip 10 packaging and wiring bonding which occurs after the formation of the interconnect structures in a semiconductor chip. As such, one skilled in the art would not consider that the silicon nitride and amino silane bilayer disclosed in Van Andel et al. and Ponjée et al. for use in packing and wiring bonding could be used in an interconnect structure.

This assertion is respectfully traversed as being an incomprehensible non-sequitur because it amounts to asserting that one skilled in the art would not consider the disclosure of the applied prior art for use in an

Art Unit: 2822

interconnect structure because the applied prior art is concerned with interconnect structures.

Applicant further alleges:

However, if the silicon nitride layer 20 capped the aluminum bonding pads 18, as suggested by the Examiner, the aluminum bonding pads 18 and the metal wires 15 would become electrically isolated by the silicon nitride layer 20 and would no longer be electrically connected to each other. Consequently, the semiconductor chip 10 would no longer be electrically connected to the lead frame t4. Therefore, the proposed modification of the Van Andel reference or combination thereof with the AAPA, as suggested by the Examiner, would change the principle of operation of the Van Andel invention. The proposed modification or combination is thus inappropriate and cannot be used to support *prima facie* case of obviousness. . . . In the outstanding Office Action, the Examiner also asserted that the proposed substitution of the amino silane layer 200 of the AAPA with the bi-layer coating of Ponjée would provide a first layer of silicon nitride entirely on a terminal layer that includes at least one metallic component. However, if the silicon nitride layer 3 of Ponjée was not locally removed to form apertures therein but was allowed to extend entirely on the contact pads 2 in the final structure of Ponjée, as suggested by the Examiner, no electrical connections could be made to the contact pads 2, and the semiconductor device 1 of Ponjée would become completely isolated. Therefore, the proposed modification of the Ponjée reference or combination thereof with the AAPA, as suggested by the Examiner, would change the principle of operation of the Ponjée invention. Such a proposed modification or combination is thus inappropriate and cannot be used to support *prima facie* case of obviousness.

These allegations are respectfully traversed because there is no suggestion in the Office action that the silicon nitride layer 20 capped the aluminum bonding pads 18. Nor is it asserted that the proposed substitution



Art Unit: 2822

of the amino silane layer 200 of the AAPA with the bi-layer coating of Ponjée would provide a first layer of silicon nitride entirely on a terminal layer that includes at least one metallic component. In addition, these allegations are respectfully deemed unpersuasive because they are unsupported by proof or a showing of facts; hence, they essentially amount to mere conjecture and they are of no probative value. See MPEP 716.01(c), and, Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the "preliminary identification of a human b - NGF - like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); In re Beattie, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); Ex parte George, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2822

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**For information on the status of this application applicant should check PAIR:**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Alternatively, applicant may contact the File Information Unit at (703) 308-2733. Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.**

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.  
The fax phone number for group 2800 is (571) 273-8300.

/David E Graybill/  
Primary Examiner, Art Unit 2822